CLAIMS

1. A method for reducing the number of feeders between a radio base station (1) and a diversity antenna arrangement comprising at least two antennas (10-13) each adapted for reception of individual RF signals, said RF signals all being at the same frequency **characterized by** converting one or more received antenna signals into a corresponding number of IF (intermediate frequency) signals by mixing with a first set of a corresponding number of reference signals (f1-f4), and forwarding one of the IF signals together with either a non-converted, original, antenna signal and/or with other converted IF signals to the base station on a reduced number of feeders (2, 4).

2. A method in accordance with claim 1 wherein the diversity antenna arrangement comprises n (n=integer) antennas **characterized by** converting all received antenna signals except one into IF signals and forwarding the non-converted antenna signal together with all IF signals to the radio base station on a single feeder, thus providing n-way diversity with one (a single) feeder.

3. A method in accordance with claim 1 wherein the diversity antenna arrangement comprises n (n=integer) antennas **characterized by** converting all received antenna signals and forwarding them to the radio base station on a single feeder thus providing n-way diversity with one (a single) feeder.

4. A method in accordance with claim 1, **characterized by** converting the IF signals to second IF frequencies by mixing them with a second set of reference signals (f5-f7) in order to obtain a second set of IF signals which are forwarded on the reduced number of feeders.

5. A method in accordance with claim 1 wherein the diversity antenna arrangement comprises a first (10) and a second (11) antenna **characterized by** converting the antenna signal on the second antenna into an IF signal and forwarding the IF signal together with the non-converted antenna signal on the first antenna to the radio base station on a single feeder (2) , thus providing 2-way diversity with one (a single) feeder.

6. A method in accordance with claim 1 wherein the diversity antenna arrangement comprises a first (10), second (11), third (12) and fourth (13) antenna characterized by converting the RF signals from the second and

fourth antennas into a first and second IF signals, both of the same intermediate frequency, forwarding the non-converted antenna signal on the first antenna together with the first IF signal on a first feeder to the base station, and forwarding the non-converted antenna signal on the third antenna together with the second IF signal on a second feeder to the base station, thus providing 4 way diversity with two feeders (2, 4).

7. A method in accordance with any of claims 1 to 5 **characterized by** converting, at the radio base station, the IF signals into other IF signals, all on the same intermediate frequency, by mixing them with a set of reference signals (f5-f8) and subjecting the twice frequency converted signals on the common intermediate frequency to diversity signal processing.

8. A device for reducing the number of feeders between a radio base station (1) and a diversity antenna arrangement comprising at least two diversity antennas (10-13) each adapted for reception of individual RF signals, said RF signals all being of the same frequency **characterized by** one or more frequency converters (36-38) each adapted to convert a respective antenna signal to a respective intermediate frequency signal (IF signal) by mixing it with a predetermined frequency (f1, f2, f3 or f4), a combiner (39) combining one of the IF signals with either a non-converted antenna signal and/or with other of the IF signals to form a composite signal which is forwarded to the radio base station on a reduced number of feeders (2, 4).

9. A device in accordance with claim 8, wherein an RX signal from a diversity antenna follows a diversity branch (A-D) **characterized by** providing a frequency converter (36-38) in each diversity branch except one.

10. A device in accordance with claim 8 , wherein an RX signal from a diversity antenna follows a diversity branch (A-D) **characterized by** providing a frequency converter (46, 36-38) in each diversity branch

11. A device in accordance with claim 7, **characterized by** a second set of frequency converters (47-49) adapted to convert the first set of IF signals into a second set of IF signals for transport to the radio base station on the reduced number of feeders.

12. A device in accordance with claim 7 or 8 wherein there are two diversity antennas (10, 11), one (10) of which is connected to a first duplex filter (14) so as to provide for reception and transmitting **characterized by** a single frequency converter (36) converting the antenna signal from the second antenna (11) to an intermediate frequency to form an IF signal, the combiner (39) combining the original RX signal from the first antenna (10) with the IF signal into a composite signal, and a single feeder (2) forwarding the composite signal to the base station, thus providing 2-way diversity with one (a single) feeder (2).

13. A device in accordance with claim 9 **characterized by** duplicating the device in order to provide a device comprising four antennas (10-13) and two feeders (2,4), thus providing 4-way diversity with two feeders.

14. A frequency converter unit for use with at least one feeder (2) on which a plurality of signals at mutually different frequencies are transported, **characterized by** a corresponding plurality of frequency converters (55-58) for converting the signals into a corresponding number of signals all at the same frequency (RX1).

15. A radio base station comprising a transceiver (TRX) with a plurality of frequency converters adapted to provide frequency translated signals, called diversity signals, all at the same frequency and means for signal processing the diversity signals in order to obtain an enhanced signal **characterized by** means connected to the input of the transceiver and adapted to receive from one feeder at least one intermediate frequency signal (IF signal) together with either a non-frequency translated RF antenna signal and/or other converted IF signals, and to supply said latter signals to respective ones of said frequency converters so as to provide said diversity signals.

16. A site comprising a radio base station (RBS), at least a tower-mounted unit (TMA) with filters (14) and RF amplifiers (17), at least two antennas (10-13) for providing diversity, and at least a feeder (2, 4) extending between the TMA and the RBS for exchange of RX and TX signals, the signals received by the antennas being RF signals which all are of the same RX frequency **characterized by** at least one frequency converter (36-38) provided in the TMA

and connected to one of the diversity antennas in order to convert the antenna's RF signal into an IF signal at a non-used frequency, and a combiner (39) combining the IF signal with either a non-converted RF antenna signal and/or other converted IF signals into a composite signal which is applied to said feeder, thereby providing a reduced number of feeders.

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